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Amendments to the Drawings

The replacement sheets of drawings attached hereto as **Exhibit A** include changes to, and replace, Figures 20 and 21 of the original sheets of drawings.

Label for step S7 has been added in Fig. 20.

Figure 21 is now labeled as prior art.

Attachment: replacement sheets of drawings for Figures 20 and 21

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REMARKS

The application has been reviewed in light of the Office Action dated November 20, 2007. Claims 1-13 were pending. By this Amendment, claim 1 has been amended to clarify the claimed subject matter, claims 2-13 have been canceled, without prejudice or disclaimer, and new claims 14-22 have been added. Accordingly, claims 1 and 14-22 are now pending, with claims 1, 16 and 22 being in independent form.

The drawings were objected to as having informalities.

By this Amendment, the specification and the drawings having been amended to correct various informalities therein.

Replacement sheets of drawings for Figs. 20 and 21 are attached hereto as **Exhibit A**.

Label "24" is not referenced in the specification at page 16, lines 3-4.

Withdrawal of the objections to the drawings is respectfully requested.

Claims 1 and 2 were rejected under 35 U.S.C. § 102(b) as purportedly anticipated by Maki et al. (US 2002/0126193 A1). Claim 3 was rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Maki in view of Tamaki et al. (JP 5-224571). Claims 4-11 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Maki in view of U.S. Patent No. 6,097,408 to Fukushima et al. Claim 12 was rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Maki in view of Fukushima and further in view of U.S. Patent No. 6,909,872 to Eskey and Kashiwagi et al. (US 2001/0028381 A1). Claim 13 was rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Maki and further in view of Kawada et al. (JP 9-254460).

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claim 1 is patentable over the cited art, for at least the

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following reasons.

This application relates to various improvements devised by applicant to an image forming apparatus to minimize deviation of an impact position of an ink drop and suppress adherence of ink mist to a head discharge nozzle, and thereby allow for high quality image.

For example, in an aspect of the present application (claim 1), the image forming apparatus includes a conveyance unit comprising a conveyance belt wound around at least two rollers, a charging unit provided in the conveyance unit to supply an AC bias voltage to the conveyance unit, and a charge eliminating unit disposed on a downstream side of a position where the recording sheet is conveyed along a curvature of each of the rollers by the conveyance belt, in the movement direction of the conveyance unit.

In another aspect of the present application (claim 16), the image forming apparatus is configured so that the movement distance of the conveyance unit from the charging unit to the charge eliminating unit is represented by a distance that is obtained by subtracting $(1/2)X$ from an integral multiple of the charging period length X . By this configuration, the image forming apparatus can be controlled using a single power supply such that the potential of the conveyance belt and the potential of a recording sheet are reversed to each other.

In another aspect of the present application (claim 22), the image forming apparatus is configured so that a charging unit is provided in the conveyance unit to supply an AC bias voltage to the conveyance unit, and a heating unit is disposed at a position on an upstream side of the charge eliminating unit in the movement direction of the conveyance unit. When AC bias supply is used, charge on a surface of a recording sheet moves and disappears with time which is quite different from the case in which DC bias supply is used. In a case of DC bias supply, the charge on the surface of the recording sheet is difficult to move and remains if charge

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elimination is not performed. A configuration in which AC bias supply is used and the recording sheet is heated by a heating unit disposed at the upstream position of the charge eliminator in the movement direction of the conveyance belt promotes movement of the sheet surface potential, and the charge on the surface of the recording sheet can be easily removed by the charge eliminator.

Maki, as understood by Applicant, proposes a recording-medium conveying device including a belt charging unit and a conveying belt wound around a driving roller and a driven roller so as to convey a recording medium to an image recording part, wherein the belt charging unit is provided in contact with an insulating layer of the conveying belt so as to charge the insulating layer with a positive charge and a negative charge alternately in a moving direction of the conveying belt by applying an AC bias to the conveying belt.

Maki, as acknowledged in the Office Action, does not disclose or suggest (i) a charge eliminating unit disposed on a downstream side of a position where the recording sheet is conveyed along a curvature of each of the rollers by the conveyance belt, in the movement direction of the conveyance unit (claim 1 of the present application), (ii) a movement distance of the conveyance unit from the charging unit to the charge eliminating unit is represented by a distance that is obtained by subtracting $(1/2)X$ from an integral multiple of X where X denotes a charging period length from a positively charged portion of the conveyance unit to a negatively charged portion of the conveyance unit (claim 16 of the present application), and/or (iii) a heating unit is disposed at a position on an upstream side of the charge eliminating unit in the movement direction of the conveyance unit (claim 22 of the present application).

Fukushima, as understood by Applicant, proposes an ink jet recording apparatus provided with a conveying belt (1) for conveying a recording medium (10) by the attraction of static

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electricity generated by application of a positive charge from a charging roller (4), a power source (8, 8a) provided to supply a negative charge through an electrode in contact with the recording medium conveyed by the conveying belt. Since the conveyance belt is positively charged by the charging roller and the recording medium is negatively charged by the power supply, the attraction between recording medium conveyance belt is enhanced.

However, while Fukushima proposes negatively charging the recording medium, Fukushima, contrary to the contention in the Office Action, does not disclose or suggest providing a charge eliminating unit eliminating charge of a printing surface of the recording sheet and disposed on a downstream side of a position where the recording sheet is conveyed along a curvature of each of the rollers by the conveyance belt, in the movement direction of the conveyance unit, as provided by the subject matter of claim 1 of the present application.

Further, Fukushima, like Maki, as acknowledged in the Office Action, does not disclose or suggest configuring the image forming apparatus such that a movement distance of the conveyance unit from the charging unit to the charge eliminating unit is represented by a distance that is obtained by subtracting $(1/2)X$ from an integral multiple of X where X denotes a charging period length from a positively charged portion of the conveyance unit to a negatively charged portion of the conveyance unit (claim 16 of the present application). Such feature and its advantages are not within the common knowledge of one of ordinary skill in the art, and therefore, contrary to the unsupported contention in the Office Action, it would not have been obvious to modify the combination of Maki and Fukushima to include such feature.

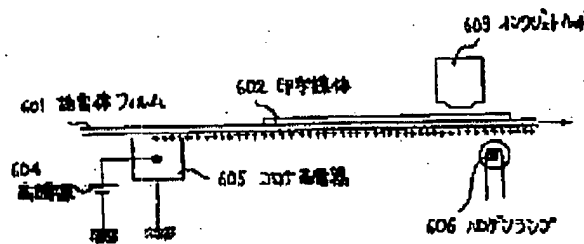
In addition, Fukushima, like the other cited references, does not disclose or suggest a heating unit is disposed at a position on an upstream side of the charge eliminating unit in the movement direction of the conveyance unit (claim 22 of the present application).

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Kawada, as understood by Applicant, proposes a paper transport mechanism wherein a rear face (that is away from the print head) of the print medium is attracted by an electrostatic suction plate. Fig. 6 (reproduced below) of Kawada was cited in the Office Action.

【図6】



In the apparatus shown in Fig. 6 of Kawada, power supply 604 supplies device 605 with the charge to charge dielectric film 601 in order to facilitate attraction of printing medium 602 to the film 601. Halogen lamp 606 is strategically positioned slightly upstream of the print head, in order to dry the ink promptly after it is deposited by the print head on the printing medium.

However, Kawada, contrary to the contention in the Office Action, does not disclose or suggest a charge eliminating unit eliminating charge of a printing surface of the recording sheet, and therefore also fails to disclose or suggest the strategy of positioning a heating unit relative to such a charge eliminating unit.

None of the cited references discloses or suggests providing an image forming apparatus with a heating unit disposed at a position on an upstream side of the charge eliminating unit in the movement direction of the conveyance unit (claim 22 of the present application). Further, such feature and its advantages are not within the common knowledge of one of ordinary skill in the art, and therefore it would not have been obvious to modify the combination of the cited art to include such feature.

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Likewise, the remaining cited references do not disclose or suggest (i) a charge eliminating unit disposed on a downstream side of a position where the recording sheet is conveyed along a curvature of each of the rollers by the conveyance belt, in the movement direction of the conveyance unit (claim 1 of the present application), and/or (ii) a movement distance of the conveyance unit from the charging unit to the charge eliminating unit is represented by a distance that is obtained by subtracting $(1/2)X$ from an integral multiple of X where X denotes a charging period length from a positively charged portion of the conveyance unit to a negatively charged portion of the conveyance unit (claim 16 of the present application).

Accordingly, for at least the above-stated reasons, Applicant respectfully submits that independent claims 1, 16 and 22, and the claims depending therefrom, are patentable over the cited art.

In view of the remarks hereinabove, Applicant submits that the application is now in condition for allowance, and earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any fees that are required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



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EXHIBIT A

to
AMENDMENT
(Serial No. 10/563,698)